and the communication (comm.) links for those nodes. (Armstrong, col. 4, lines 55-57).
Armstrong describes the node monitoring function as follows:

> "... When a node is brought on-line, the node monitor software 20 is
> loaded, and handles all tasks associated with implementing the monitor function
> for that node. The principal function ... is the circulation and maintenance of a
> circulating status table (CST) – each on-line node receiving the CST writes its
> status into the CST and reads the status of all other nodes from the CST..."
> (Armstrong, col. 4 lines 62 – col. 5 lines 2) ...
>
> "... The monitor software running in each on-line node is responsible for
> indicating that a node has changed node status ... In the on-line nodes, the node
> monitor tasks *routinely poll all nodes listed as off-line in the CST... At each on-line
> node, during regular one minute polling intervals*, the node monitor task transmits
> a polling packet to each of the off-line nodes between itself and the on-line node...
> These unsolicited boomerang packets will be received by the packet manager task
> of the destination node if that node is on-line..." Armstrong col. 9 lines 58 – col.
> 10 lines 5.
>
> "... Link Status Monitoring ... In each node, the node monitor task is
> responsible for determining link status for the network communications link(s)
> over which a node will attempt to communicate... This link monitor function is
> *performed continuously, independent of the operation of the CST server task...*
> During *regular link monitoring intervals (such as one second)*, the node monitor
> task attempts to communicate over each link to any other on-line node in the
> system for which that link is operational..."

Accordingly, it would appear that Armstrong describes a link and node monitoring
status that *regularly and periodically* checks node and link status.

Independent Claim 1:

In contrast, Applicant's claim 1 recites a method including the step of "...
periodically calculating a reliability factor for communicating with a neighbor; and ...
*varying a frequency for sending keep-alive messages to the neighbor based upon the
reliability factor...*"

In contrast, as cited above, Armstrong teaches only that neighbors are "routinely
polled" for node status information, or "continuously" monitored at "regular link
monitoring intervals (such as one second)..." No teaching or suggestion of varying
the frequency of keep-alive messages in response to any reliability analysis performed
by the node is either shown, suggested or inferred by Armstrong.

The Examiner states in page 3 of the office action that "Applicants clearly have failed to explicitly identify specific claim limitations which would define a patentable distinction over the art..." Applicants submit the following:

Armstrong neither describes nor suggests the step of *"periodically calculating a reliability factor"* as recited in claim 1. In fact, although Armstrong passes a CST table around, and certain reliability data could be inferred from the receipt of the CST table (or lack of it), there is no mention or suggestion of the limitation of 'calculating a reliability factor' as recited in claim 1. Accordingly, for at least this reason, claim 1 is patentably distinct over the art, and the rejection should be removed.

However, Armstrong also fails to teach, describe or suggest the claim limitation of *"varying a frequency for sending keep-alive messages to the neighbor based upon the reliability factor"* as recited in claim 1. As explained in the previous office action, it is Applicant's position that the frequency with which Armstrong forwards keep alive messages is fixed, it does not vary according to a 'periodically calculated reliability factor' as clearly recited in the claims of the present invention.

Accordingly, for at least the reasons stated above, claim 1 is patentably distinct over Armstrong, and the rejection should be withdrawn.

Independent claims 8, 15 and 22:

The remaining independent claims include limitations similar to those recited in claim For example, independent claims 8 and 15 include the limitation of "...frequency calculation logic responsive to the reliability calculation logic and operably coupled to **vary a frequency for sending keep-alive messages to the neighbor based upon the reliability factor** ..." Independent claim 22 recites the limitation of "...and wherein the node is operably coupled **to vary the frequency for sending keep-alive messages to the neighbor based upon a periodically updated reliability factor for communicating with the neighbor over the communication link...**" Accordingly, for reasons similar to those put forth with regard to claim 1, claims 8, 15 and 22 are similarly in condition for allowance.

Dependent claims 2-7, 9-14, 16-21 and 23-24:

3

The dependent claims of the present case serve to further limit their associated parent claims, and are therefore allowable for at least the reasons put forth with regard to the parent claims.
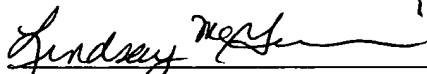
Newly added claims 25 and 26:

Applicants have added two new claims, which depend upon parent independent claims. Applicant's submit that these claims are allowable for at least the reasons put forth with regard to the parent claims.

Conclusion

Accordingly, in view of the above remarks, Applicant submits that claims 1-26 are in condition for allowance. A notice to this affect is requested. If the Examiner believes that there are still issues to be addressed with regard to the patentability of the claims, he is invited to contact Applicant's attorney at the below listed number.

Respectfully Submitted,

3/6/2003
Date

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REPLACEMENT SHEETS

1. (Currently Amended) A method for sending keep-alive messages by a node to a neighbor in a communication network, the method comprising:

   [determining] periodically calculating a reliability factor for communicating with a neighbor; and

   [determining] varying a frequency for sending keep-alive messages to the neighbor based upon the reliability factor.

2. (Currently Amended) The method of claim 1, wherein [determining] calculating the reliability factor for communicating with the neighbor comprises:

   determining a reliability for the neighbor; and

   determining calculating the reliability factor based upon the reliability for the neighbor.

3. (Currently Amended) The method of claim 1, wherein determining calculating the reliability factor for communicating with the neighbor comprises:

   determining measuring a reliability for of a communication link to the neighbor; and

   determining calculating the reliability factor based upon the reliability for of the communication link to the neighbor.

4. (Currently Amended) The method of claim 1, wherein determining calculating the reliability factor for communicating with the neighbor comprises:

   determining a reliability for the neighbor;

   determining measuring a reliability for of a communication link to the neighbor;

   assigning a relative weight to each of the reliability for the neighbor and the reliability for of the communication link to the neighbor;

~~determining~~ calculating the reliability factor to be a weighted average of the reliability for the neighbor and the reliability ~~for~~ of the communication link to the neighbor.

5. (Currently Amended) The method of claim 1, wherein ~~determining~~ varying the frequency for sending keep-alive messages to the neighbor based upon the reliability comprises:

setting the frequency for sending keep-alive messages to the neighbor in inverse proportion to the reliability factor.

6. (Original) The method of claim 1, further comprising:

updating the reliability factor; and

adjusting the frequency for sending keep-alive messages to the neighbor based upon the reliability factor.

7. (Original) The method of claim 6, wherein adjusting the frequency for sending keep-alive messages to the neighbor comprises:

reducing the frequency for sending keep-alive messages to the neighbor, if the updated reliability factor represents a reliability improvement for communicating with the neighbor; and

increasing the frequency for sending keep-alive messages to the neighbor, if the updated reliability factor represents a reliability degradation for communicating with the neighbor.

8. (Currently Amended) A device for sending keep-alive message to a neighbor in a communication network, the device comprising:

reliability ~~determination~~ calculation logic operably coupled to periodically calculate ~~determine~~ a reliability factor for communicating with the neighbor; and

frequency ~~determination~~ variation logic responsive to the reliability ~~determination~~ calculation logic and operably coupled to ~~determine~~ calculate a frequency for sending keep-alive messages to the neighbor based upon the reliability factor.

6

9. (Currently Amended) The device of claim 8, wherein the reliability ~~determination~~ calculation logic is operably coupled to determine a reliability for the neighbor and ~~determine~~ calculate the reliability factor based upon the reliability for the neighbor.

10. (Currently Amended) The device of claim 8, wherein the reliability ~~determination~~ calculation logic is operably coupled to determine a reliability for a communication link to the neighbor and determine the reliability factor based upon the reliability for the communication link to the neighbor.

11. (Currently Amended) The device of claim 8, wherein the reliability ~~determination~~ calculation logic is operably coupled to determine a reliability for the neighbor, ~~determine~~ measure a reliability for a communication link to the neighbor, assign a relative weight to each of the reliability for the neighbor and the reliability for the communication link to the neighbor, and ~~determine~~ calculate the reliability factor to be a weighted average of the reliability of the neighbor and the reliability of the communication link to the neighbor.

12. (Currently) The device of claim 8, wherein the frequency ~~determination~~ variation logic is operably coupled to set the frequency for sending keep-alive messages to the neighbor in inverse proportion to the reliability factor.

13. (Currently Amended) The device of claim 8, wherein the reliability ~~determination~~ calculation logic is operably coupled to update the reliability factor, and wherein the frequency ~~determination~~ variation logic is operably coupled to adjust the frequency for sending keep-alive messages to the neighbor based upon the updated reliability factor.

14. (Currently Amended) The device of claim 13, wherein the frequency ~~determination~~ variation logic is operably coupled to reduce the frequency for sending keep alive messages to the neighbor if the updated reliability factor represents a reliability improvement for communicating with the neighbor and increase the frequency for

sending keep-alive messages to the neighbor if the updated reliability factor represents a degradation for communicating with the neighbor.

15. (Currently Amended) A program product comprising a computer readable medium having embodied thereon a computer program for sending keep-alive messages to a neighbor in a communication network, the computer program comprising:

reliability ~~determination~~ calculation logic operably coupled to periodically calculate ~~determine~~ a reliability factor for communicating with the neighbor; and frequency ~~determination~~ variation logic responsive to the reliability ~~determination~~ calculation logic and operably coupled to determine a frequency for sending keep-alive messages to the neighbor based upon the reliability factor.

16. (Currently Amended) The program product of claim 15, wherein the reliability ~~determination~~ calculation logic is programmed to determine a reliability for the neighbor and ~~determine~~ calculate the reliability factor based upon the reliability for the neighbor.

17. (Currently Amended) The program product of claim 15, wherein the reliability ~~determination~~ calculation logic is programmed to ~~determine~~ measure a reliability for a communication link to the neighbor and ~~determine~~ calculate the reliability factor based upon the reliability for the communication link to the neighbor

18. (Currently Amended) The program product of claim 15, wherein the reliability ~~determination~~ calculation logic is programmed to determine a reliability for the neighbor, ~~determine~~ measure a reliability for a communication link to the neighbor, assign a relative weight to each of the reliability for the neighbor and the reliability for the communication link to the neighbor, and ~~determine~~ calculate the reliability factor to be a weighted average of the reliability of the neighbor and the reliability of the communication link to the neighbor.

19. (Currently Amended) The program product of claim 15, wherein the frequency ~~determination~~ variation logic is programmed to set the frequency for sending keep-alive messages to the neighbor in inverse proportion to the reliability factor.

20. (Currently Amended) The program product of claim 15, wherein the reliability ~~determination~~ calculation logic is programmed to update the reliability factor, and wherein the frequency ~~determination~~ variation logic is operably coupled to adjust the frequency for sending keep-alive messages to the neighbor based upon the updated reliability factor.

21. (Currently Amended) The program product of claim 15, wherein the frequency ~~determination~~ variation logic is programmed to reduce the frequency for sending keep alive messages to the neighbor if the updated reliability factor represents a reliability improvement for communicating with the neighbor and increase the frequency for sending keep-alive messages to the neighbor if the updated reliability factor represents a degradation for communicating with the neighbor.

22. (Currently Amended) A communication system comprising a plurality of interconnected devices including a node and a neighbor in communication over a link, wherein the node is operably coupled to send keep-alive messages to the neighbor, and wherein the node is operably coupled to ~~determine~~ vary the frequency for sending keep-alive messages to the neighbor based upon a periodically computed reliability factor for communicating with the neighbor over the communication link.

23. (Currently Amended) The communication system of claim 22, wherein the node is operably coupled to ~~determine~~ calculate the reliability factor based upon a reliability for the neighbor and a measured reliability for the communication link.

24. (Currently Amended) The communication system of claim 22, wherein the node is operably coupled to set the frequency for sending keep-alive messages to the neighbor in inverse proportion to the reliability factor.

9

25. (Newly Added) The method of claim 4, wherein the reliability factor (RF) is calculated using the below equation, where A is the measured reliability of the communication link to the neighbor, B is the determined reliability of the neighbor, W1 is a relative weight for A and W2 is a relative weight for B:

$$RF = (W1*A + W2*B).$$

26. (Newly Added) The device of claim 11, wherein the reliability factor (RF) is calculated using the below equation, where A is the measured reliability of the communication link to the neighbor, B is the determined reliability of the neighbor, W1 is a relative weight for A and W2 is a relative weight for B:

$$RF = (W1*A + W2*B).$$